BUSINESS INTELLIGENCE AT TELENOR PAKISTAN

Teaching Case

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Abstract

Telenor Pakistan won two "best practices" awards from The Data Warehousing Institute for its business intelligence (BI) infrastructure in 2009 and 2010. In 2011, its Director of BI was promoted to Vice President of BI for the Telenor Group that had stakes in cellular network operations across thirteen countries. The new Director of BI, Rizwan Fazal, had just been recruited from a major competitor. The challenge – as he saw it – was, "How do you take what is already a de facto 'centre-of-excellence' even further?" Prioritization was required regarding which BI projects to pursue. A balance had to be struck in trying to standardize key measures while allowing flexible best-of-breed applications for new business areas, such as mobile banking and 3G-based Internet services. Internally, his unit was being asked to act both as a judgmental arbitrator possessing a "single version of the truth" and as a non-judgmental "service-provider". With past credentials, existing challenges and future ambitions in mind, Rizwan Fazal's task was now to design a "roadmap" for BI that would satisfy all stakeholders that the unit would indeed progress ahead.

Keywords: business intelligence, analytics, telecommunications

[*] This author may be contacted to obtain the teaching note for this case.

The real challenge in our industry is how do you "do" customer-centricity? On the one hand, day-in and day-out, we collect a substantial volume of data. On the other, we start off with no demographic profile about our customer. We don't even know whether they are male or female! An enormous level of sophistication is called upon to infer these things from their usage patterns. It is in such ways that business intelligence systems have been key to delivering customer-centricity at Telenor.

- Rizwan Fazal, Director of Business Intelligence & Consumer Insights

Rizwan had just joined the cellular network operator, Telenor Pakistan (TP), as Director of Business Intelligence (BI) in June 2011. While drawing up a "roadmap" to share with all stakeholders, he reflected on the credentials of his new department. Previously, he had worked in a similar position at a competing network with a significantly larger subscriber base. It had been established a decade before TP and was also owned by a multi-national company. Yet, Rizwan observed that it was the TP BI unit that was being treated as a de facto "centre-of-excellence" by its parent company. Telenor Group had stakes in subsidiaries across thirteen countries. It was based in Norway, and had more than 20 years of exposure to the Scandinavian market alone. However, group-wide BI consultants were mostly co-opted from TP. This, in fact, led to the vacancy that Rizwan had just filled. His predecessor, Arslan Javed, had been promoted to the position of VP of BI for the all of the Telenor Group. Then, Rizwan noted that the BI infrastructure at TP had also received two international "best practices" awards. The data warehouse currently maintained about 100 terabytes of usable data, drawn from 35 different sources, and a large portion was extracted from a daily data-input of 500-600 million call detail records (CDRs).

Rizwan wondered how such credentials could be further developed. Any "roadmap" would have to address certain specific questions already awaiting his response. For example, there was the upcoming auction of 3G channel licenses. If TP wished to bid for this opportunity, how should the BI organization and its infrastructure cater for the resulting expansion of services? Then, the BI team was engaged in a number of "advanced analytics" projects. However, the Chief Marketing Officer would constantly question their value in practice with the words, "How is this '*actionable*'?" Finally, recent re-organization had made BI equal to the other departments within the Commercial division. BI was now increasingly being looked at to arbitrate matters by providing "a single version of the truth". How would BI now balance this demand with its traditionally accepted approach of being a service-provider to internal customers? Overall, Rizwan asked, "How do you take a 'centre-of-excellence' even further?"

Telenor Group

The Telenor Group dated its origins back to 1855 as "The Royal Electric Telegraph", an institution of the government of Norway. It introduced the first manual phones to the country in 1966, and so began its involvement in mobile telephony. By 1995, it completed its transition from being a state-owned entity, Norwegian Telecom, to a public limited company called "Telenor". In its home telecoms market, it had remained the incumbent since the mid-70s. So, during the 1990s, it expanded internationally to other Nordic countries, Central and Eastern Europe, and also Asia (**Exhibit 1**). It already had stakes in operations in Thailand, Bangladesh and Malaysia prior to its entry into Pakistan.

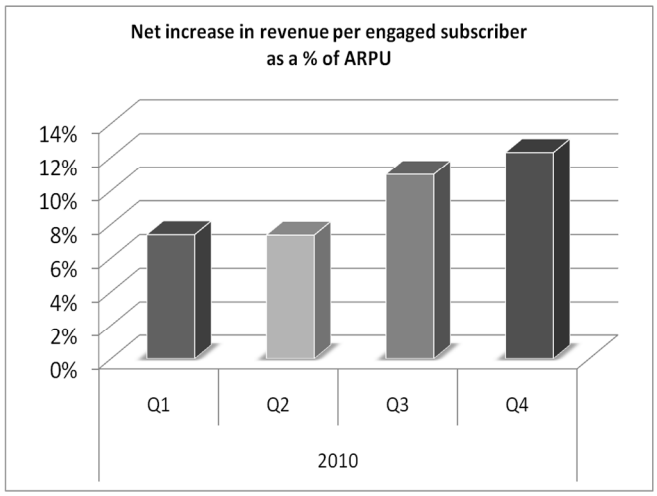
Telenor Pakistan

Telenor Pakistan (TP) started operations in March 2005 as a 100% owned subsidiary. By 2011, the Group's total investment in Pakistan reached US$2.2 billion, the same year that the first significant annual operating profit was reported (see **Exhibit 2** and **Exhibit 3**). There were two incumbent operators already there when TP and Warid Telecom both started their cellular network roll-out in Pakistan (**Exhibit 4**). Like the other networks, TP primarily focused on pre-paid subscribers (**Exhibit 5**). However, unlike its rivals, its network growth had come largely from expansion into rural areas, especially in Northern Pakistan. For example, they were the first to obtain a license for the state of Azad Kashmir. According to Director Network Services, Usman Qureshi, this spurred the aggressive expansion by Telenor in this region. Rizwan agreed that Telenor's growth had followed a unique "outside-in" process.

In 2007, Pakistan began to witness declining average revenue per user (ARPU) (**Exhibit 6**). This was consistent with the trend in the other mature markets that the Telenor Group operated in (**Exhibit 7**). Hence, with encouragement from the Group, TP diversified into mobile financial services. In late 2008, it

acquired a 51% share in a microfinance bank. The services were branded as "easypaisa", and included local and international money transfers, utility bill payments and mobile banking accounts. The first three services did not require the customer to be a Telenor network subscriber. It was local retail agents (e.g. grocery stores) that handled deposits and transfers through subscribing phones. Thus, easypaisa leveraged Telenor Pakistan's pre-existing distribution model (**Exhibit 8**). Among the services, money transfers reflected the greatest popularity: Rs. 7.9 billion ($92 million) were moved through easypaisa in 2010, and Rs. 17.4 billion ($202 million) were transferred in the first five months of 2011.[1] Only one other network had launched similar services. However, it had yet to report any significant uptake. In fact, the competitive concern that TP faced due to easypaisa was from the major national banks that had followed suit and launched their own branchless banking initiatives (e.g. UBL and MCB).

Competitive position and the role of BI



Source: Company Documents

Figure 1: Revenue increase per "engaged" subscriber

Between 2008 and 2011, figures from the local telecoms regulator indicated that the cellular network that had acquired the greatest number of subscribers was Telenor Pakistan (**Exhibit 4**). Its growth rate was second after Zong, the recently introduced China Mobile Pakistan (CMPak) brand. ARPU at TP had also remained consistently above the industry average (compare **Exhibit 6** and **Exhibit 7**).

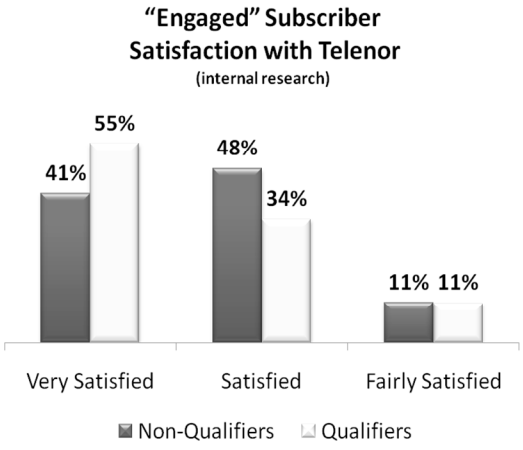
BI was seen by CMO, Aamir Ibrahim, to have been a "key enabler" for this performance. Primarily, this was thought to have occurred in the form of more focused direct marketing interactions with subscribers, also called "engagements" (often through promotional text messages). The BI unit reported that during 2010, the net increase in revenue per "engaged" subscriber (relative to overall ARPU in the year) had gone from 8% in the first quarter to 11.5% in the last (**Figure 1**). The management of BI also claimed that the impact could be seen in terms of churn (subscribers who left to join another network). Among subscribers contacted by the BI team, this was reported to be five times lower than that for other marketing channels.

Farrukh Aziz (Manager Business Analytics and Consumer Insights) vouched that such "engagements" also enabled more rapid and efficient response compared to their competitors. He cited how, for example, a rival network had once launched an "aggressive offer" targeting certain international dialing destinations. He said that BI had allowed their marketing team to quickly identify subscribers likely to favor such an offer. As a result, direct offers were texted within hours to this segment and relatively heavy costs of "above-the-line" marketing were avoided.

The role of BI was also being monitored in terms of customer satisfaction. A recent survey, carried out by TP's internal research teams in 2011, classified 80% of its "engaged" subscribers as either "satisfied" or "very satisfied" with Telenor in general (**Figure 2**). This was reported to be especially true for subscribers who had actually qualified for the offers that had been promoted.

The impact of BI was also evident during the expansion of the "easypaisa" retail agents network. A report reviewing recent mobile financial service deployments across Africa and Asia noted:

[1] M. Yasir. **Easypaisa transacts Rs 800m international remittances.** June 22, 2011, Daily Times (Pakistan).



Note: "Qualifiers" are the ones who qualify for any special offers contained in the "engagement", for example, called a number of minutes to avail a free minutes offer.

Source: Company Documents

Figure 2: Satisfaction measurement of "engaged" subscribers

But how can operators assess whether a potential agent has the means to maintain the required amount of [cash-in-hand]? Pakistan's easypaisa leverages Telenor's data on airtime agent sales to identify retailers that are healthy and liquid businesses prior to approving them as a mobile money agent.

Krugel et al., "Mobile Money for the Unbanked – Annual Report 2010"

Beyond the quantifiable impact of BI, Rizwan felt that at least one qualitative change had also taken place. He recalled how, on one occasion, Aamir had initially rejected a proposal for a certain international dialing marketing campaign. Despite that, he still chose to double-check his assumptions about the segment with the BI unit. The data he got back made him change his mind. The proposal was found viable. Rizwan sensed that, subsequently, Aamir became more cautious. Proposals were more regularly being referred back to the BI unit.

Development of BI and its organization

We have very strong sponsorship from our top management. That starts right from the Group chairman (original emphasis); he himself is very keen. Then, generally, conventional BI is technology BI and you will observe [within the industry] that it is housed within the IT division. In our case, BI is housed in Commercial. Not only that, but we do have Sami who is dedicated to the technology side and 50% of the team works for him. Then, we have Farrukh who is a pure "Commercial guy". Finally, we have Harris who leads Customer Lifecycle Management. He is responsible for bringing into action all the work done by Sami and Farrukh. So, what we have uniquely tried to do is integrate the research and analytics side with the technology side.

Rizwan Fazal, Director Business Intelligence

In the quote, Rizwan was referring to Sami Ahmed, whose official title was "Manager Business Intelligence and Data Warehousing" (see **Exhibit 9**). Hence, he was responsible for the underlying BI infrastructure. In spite of that, Sami actually agreed with Rizwan about organization, not IT, being the source of any real BI advantage they possessed within the industry.

However, this was only the most recent state of affairs. TP, too, had started BI with only a fraction of its current staff. Most of them were based in the IT division, while a few worked within the Segments & Pricing department (**Exhibit 10** and **Exhibit 11**). In planning his "roadmap", Rizwan reviewed the path that BI had taken so far - as shared with him by older members of the BI team. He considered both the infrastructure developed to date (**Exhibit 12**) and the organizational "evolution" that had run in parallel .

Origins: 2005-2007

As there were two incumbents in the market, TP was able to recruit more experienced individuals from these organizations right at the start. At launch, they had acquired a billing and CRM system and the vendor had added a data warehouse as an ancillary item in the package. Though they were only dealing with 5 data sources at the time, within a few months the Business Support Systems group began to label this set-up as "not future-proof". So by November 2005, a Teradata data warehouse was acquired and rolled out over four months. Rizwan commented on what was later regarded a key decision:

We never had the issue of legacy systems. We were a green-field project and from day one we were into data-warehousing. This is unlike my previous organization where we had to shift from legacy to data-warehousing. It was a nightmare.

Rizwan Fazal, Director Business Intelligence

Up until 2007, emphasis was placed on developing a core underlying infrastructure that would be scalable enough to support future BI applications. Data sources were continually being added. At this stage, the output was restricted to standard reports integrating multiple subject areas, seeking merely to match capabilities they observed the competition already possessed.

The team of business analysts that made use of these early BI systems primarily resided in Segments & Pricing. In parallel, the analysts would also gather data through market surveys . They not only used BI for their own segmentation work, but also catered for the BI needs of Sales & Distribution and Customer Care. The Finance division, on the other hand, had a direct interface with the BI Technical Team.

2008: the Campaign Management Solution

In 2008, the focus had shifted to development of BI applications that would better exploit the core infrastructure. It was at this time that the SAS Campaign Management Solution (CMS) was launched. This was claimed by the BI team to be an industry first. Conventional practice had been to focus on "above-the-line" market campaigns, targeting mass audiences through broadcast channels. However, CMS was expected to enable quicker and cheaper "below-the-line" campaigns. 6,000 variables were available to define, in real-time, the criteria fitting the subscriber segment of interest. For example, a manager in the Commercial division could now directly identify subscribers that during the past 30 days consumed 20 minutes of talk time and sent 300 SMSs. A retention campaign could then be launched to this fraction of the subscriber-base, sparing Telenor expensive mass broadcasts and not disturbing unconcerned users.

Figure 3: Snapshot of "Location Intelligence" using Google Earth for sales territory monitoring

Moreover, Farrukh reported that short-listing could now be done in minutes and campaigns run within an hour. The same process previously took 2 to 3 days. First, an analyst would define short-listing criteria and send it for review to an "Ad Hoc" team (part of BI in IT). If this team found any incompatibility with the querying options in the BI system, the criteria would be sent back for changes. This way, criteria went back-and-forth between the two groups. CMS, instead, did away with the need for Ad Hoc teams.

Another application developed in 2008 was a Location Intelligence (LI) prototype. It served to gain feedback from end-users and raise awareness about what else BI could do. LI enabled visualization of data already accessible in tabular form on a geographical map after it was integrated with Google Earth (sample image in **Figure 3**).

Mid-2008, the first change in the Telenor Pakistan CEO was witnessed. The American, Jon Eddy Abdullah, came in from Malaysia where he had been CTO at Telenor's DiGi subsidiary and COO at Maxis Telecommunications prior to that. This triggered a review of BI's role in TP.

2009-2010: restructuring for a grand BI vision

Things actually started off on Jon's first day. Me, Arsalan and Mr. Khalid (then CTO) thought we should show Jon the full scale of our capabilities. Jon said that, from a technology point-of-view, he had never seen anything like this in his whole career. However, the challenge he saw was: 'How do we use that?' To really monetize the potential of these capabilities, he thought that we should actually hire

researchers with PhD's. Along with this vision, he concluded that we guys should not be in Technology but in Commercial. That was the turning point for us.

Sami Uddin Ahmad, Manager Business Intelligence & Data Warehousing

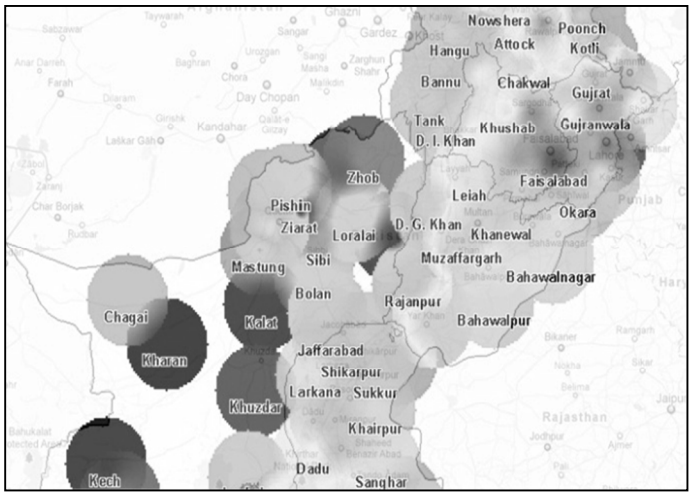
Eventually, in 2009, the functions of Business Intelligence Planning and Reporting (the technical team under Business Systems Support) and Micro-segmentation and Market Research (the analysts under Segmentation & Pricing) were all merged into one unit. Then, with the intention to ensure wider usage of BI, Jon brought the new unit one level up in the hierarchy. BI would now report directly to the VP of the Commercial Division, the Chief Marketing Officer (**Exhibit 10**). Following this, the new department began awareness campaigns for the other divisions and road-shows in their regional offices that advertised the new capabilities at hand.

This was followed by the development of various new BI applications. The central push was to enhance the usage of CMS. Regional dashboards and "advanced analytics" projects (e.g. churn prediction) were rolled out. At call centers, Behavior Centric Routing was being used. It was hoped this would identify potential churn cases and route them to appropriate specialist representatives. A customized system called "Magic Screen" was also available to aid representatives in up-selling services to the caller.

During this period, the BI department began receiving international recognition. Telenor Pakistan won two "best practices" awards from The Data Warehouse Institute (TDWI): the first in 2009 for "Enterprise Data Warehouse" and the second in 2010 for "Enterprise Business Intelligence". Furthermore, Jon led a project that resulted in the set-up of the BI Group-wide (BIG) program. It comprised mostly of BI consultants from TP, supported by those from Hungary and the Group itself. This was an initiative overseen by the Group-level Executive Management team (GEM) and CEOs of all 13 countries.

At this time, the state-of-affairs at rival operator – Mobilink – were reported by its VP Marketing to be as follows: "Our biggest issue in 2009 was we had no real visibility into the interaction between primary sales and wholesaler, wholesalers and retailer and retailers and consumer."[2]

2011: Location Intelligence and further refinements



Source: Company documents

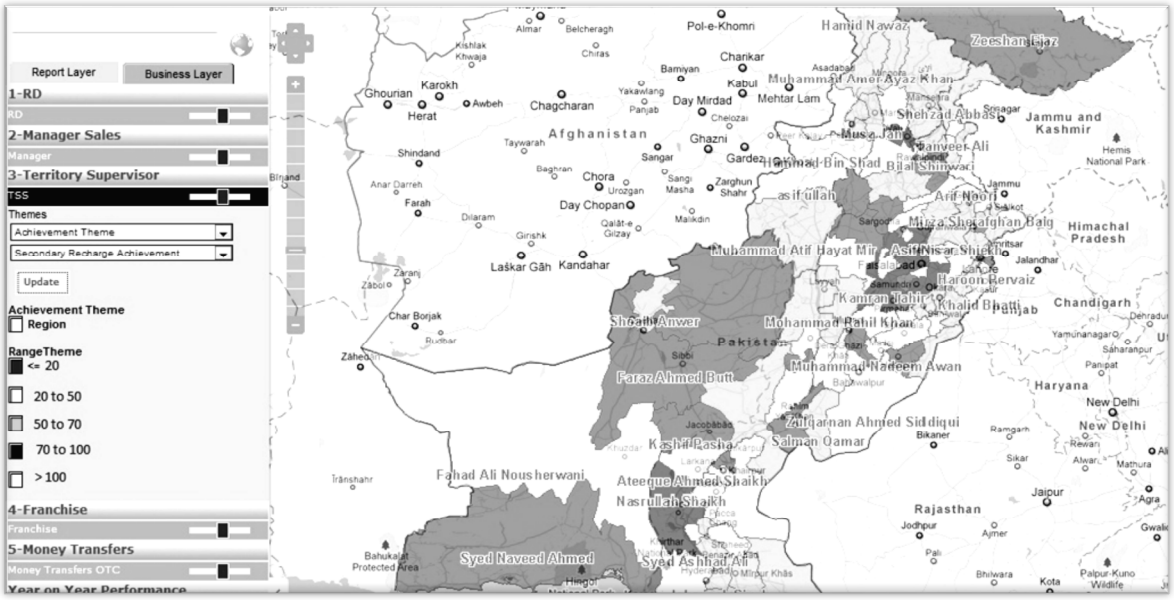
Figure 4: Screenshot of franchise-wise sales performance across regions

After further development, Location Intelligence (LI) was formally launched in 2011. This version was provided by a BI vendor that specialized in mapping intelligence. Rizwan termed it as "the zenith of business intelligence". It facilitated an end-to-end visualization of the distribution channel network (**Figure 4**). This was especially important to TP. They competed for loyalty from franchised retail outlets based on clearly demarcated and commercially viable sales territories. The easypaisa team, for example, mentioned this relationship with its franchisees as a key asset in the roll-out of their novel services.

Through LI, sales performance for each region could graphically be monitored against various metrics, such as "recharges, call traffic, activations and sale-to-churn ratio" [3] as well as SIM-card fraud cases (**Figure 5**).

[2] Teradata, "Mobilink: The Innovative Pursuit of Clearer, Broader, Deeper Business Insights" *Teradata Business Whitepaper*, 2011.

[3] Pitney Bowes Business Insight, "Communications Case Study: Telenor Pakistan", 2011. Accessed from http://www.pbsoftware.eu/uk/files/download/case-studies/ on 23 February, 2012.



Source: Company documents

Figure 5: LI screenshot showing Territory Supervisor achievement on secondary recharges

Local sales teams were already accountable for these metrics. However, now it was claimed that actions could be initiated in seconds on issues that would otherwise follow a 2-3 week decision-making process. Geographic visualization also revealed aspects of transactions that previously went un-noticed. For example, the BI team reported that when LI was being exhibited to people operating easypaisa, they made a discovery. While noteworthy remittances were originally thought only to be those outgoing from major cities, they found that substantial money transfers even occurred *within* the city of Karachi. Further analysis indicated this was due to the security situation that existed here in the largest city of Pakistan.

Besides LI, analytical models were also being developed by the Advanced Analytics group, such as Market Tracking and Social Network Analysis. The former would allow BI to monitor the calling patterns of non-Telenor numbers that had called a Telenor subscriber over a period of time to detect churn patterns of their competitors. Social Network Analysis, could – for example – identify the most active subscriber within a network of numbers (also called the "queen bee" subscriber). Certain targeted campaigns could then be developed with the social network dynamics in mind.

However, Rizwan felt that beyond CMS, Magic Screen and LI, other "Advanced Analytics" were proving difficult to sell. Aamir, for one, continually asked, "How is this 'actionable'? How can we actually use it to do something really valuable?" Rizwan found it difficult to answer these questions in the case of certain churn prediction models they had developed. They tended to detect a customer was about to leave only when it was too late to take any effective action.

On the organizational front, a final refinement was instituted early in 2011. Some in the Operations group of the Technical Division provided essential support to the BI Planning team, but were left there to cater to the BI needs of the other un-served divisions. However, reporting to multiple verticals proved to be a challenge. For example, inconsistencies would appear in what came through BI vis-à-vis what Finance reported. This led to the eventual move of even this Operations team to the Commercial BI division.

In parallel, more people with a marketing orientation were being recruited. In total, the unit had 71 employees, with an approximate ratio of 30:40 of technology-oriented to market-research-oriented staff. 18 employees among these were dedicated to Customer Lifecycle Management, the team that ran direct marketing engagements with subscribers through CMS.

Rizwan Fazal, of course, had joined mid-way through 2011 to take over from the Director since inception of the BI unit in Commercial, namely Arslan Javed. Arslan was promoted to the Telenor Group and subsequently became VP and Head of Business Intelligence there. Jon Eddy left earlier, in March, to head DTAC (Telenor's Thai subsidiary). He was replaced with Christian Albech (from Telenor Broadcast, based

in Norway). It was with this backdrop that Rizwan sought to address the challenges faced by the BI department at TP.

Challenges to address

As matters stood, one metric used to track the utility of BI to the other divisions was the query traffic they generated. Based on this, the share of total usage from Commerical, Finance and others was found by the BI team to be around 62%, 23%, and 15%, respectively. However, Rizwan highlighted one basic on-going challenge in this regard:

You can generate lots of information, lots of reports, lots of presentations…but are the people really ready to use it correctly?…It all depends on the C-level: do they really want to make this a backbone? They can do two things: use their hunch and stick to that; or *they come back and get it verified against the data. The financial commitment from the top is there: we have invested $20 million and incur $3 million as annual operating expense. But the culture of decision-making we aspire to is very rare, even worldwide. Harrah's Entertainment [hotels and casino resort manager] is one of these extreme exceptions. What's it they say? There are three ways to get fired at Harrah's: steal, harass women, or institute a program or policy without first running an experiment.*[4]

Rizwan Fazal, Director Business Intelligence

Another challenge Rizwan faced was that, traditionally, the BI division had played the role of a service-provider: responding only when business users actually made a request. However, following the elevation of BI in the organization, situations now arose where the requirements of various users needed to be balanced. Sales, for example, was interested in channel-wise analysis; Marketing, instead, took a brand-wise view. The CMO would be interested in higher-level targets that allowed comparisons across all Commercial departments. In fact, he highlighted that he himself was a service-provider to other Telenor divisions. Therefore, he would also represent the needs of Finance or easypaisa at meetings.

At a deeper level, the BI team viewed the problem to be that they were expected to be arbitrators – keepers of "a single version of the truth". Yet, they found they could not provide objective definitions even for some of the most regularly used terms . For example, how long should a person have last used their SIM to be termed a "subscriber"? How would one even define "use" – what level of activity? Next, how would the location of this subscriber be defined? Was it where they last topped-up credit, where they made the last ten calls from, or the area code of their SIM? How should they address this challenge?

Constantly changing offerings made standardization a moving target. Easypaisa had brought a new range of services, and with it, new performance indicators to monitor. Entry into 3G would enhance internet usage over the phone, and so, new metrics of usage-analysis would complicate matters further. Data model definitions were tested with each change.

Rizwan saw this challenge the goal of maintaining both flexible data definition models as well as a scalable underlying BI infrastructure. The latter was further tested by the variety of specialist BI application vendors that they were bringing. SAS was used for the campaign management, Pitney Bowes for the mapping intelligence and Business Objects to provide graphical "dashboards". The queries from all these systems negotiated with the Teradata Enterprise Warehouse at the core (**Exhibit 13**). Moving forward, the difficulty remained in ensuring applications were both "best-of-breed", yet, able to integrate with the existing data warehouse set-up. Currently the policy was to give priority to better integration. But Rizwan wondered whether such a policy should be sustained? If so, how?

What was the best way for Telenor Pakistan to address all these technical and organizational challenges? What should the BI roadmap look like for the next three years?

[4] Originally a quote from Gary Loveman, CEO of Harrah's in Pfeffer, J. and Sutton, R. (2006) "*Hard Facts - Dangerous Half truths ,and Total Non-sense*", Boston, MA: Harvard Business Press.

Exhibits

Exhibit 1: Stake in international telecom operations

Telenor Group's shareholdings in mobile and fixed businesses as on 31 March 2010		
Business	**Mobile Subscriptions**	**Ownership Interest**
1. Telenor -Norway 2. Telenor - Sweden 3. Telenor - Denmark 4. Pannon – Hungary 5. Telenor Serbia 6. Promonte – Montenegro 7. Telenor Pakistan	3.0 M 2.0 M 2.1 M 3.5 M 2.9 M 432,000 23.3M	100% in all
8. DTAC – Thailand	20.3 M	65.5%
9. DiGi.Com – Malaysia	7.9 M	49%
10. Grameenphone – Bangladesh	23.9 M	55.8%
11. Uninor – India	2.2 M	67.3%
12. Kyivstar – Ukraine	21.9 M	56.5%
13. VimpelCom – Russia	65.6 M	33.6%

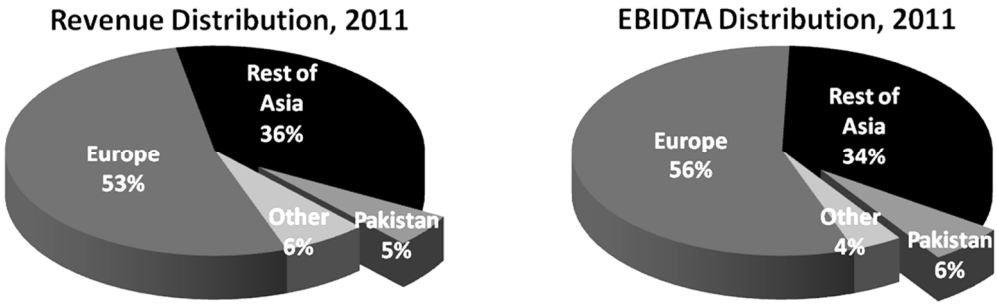
Source: "All Business Descriptions in One" document on Telenor Group website dated May 2010 (last accessed 26 June, 2010: http://www.telenor.com/en/resources/images/business-description-052010-telenor-group_tcm28-30387.pdf)

Exhibit 2: Income statement for Telenor Pakistan

(USD in millions)	**2008**	**2009**	**2010**	**2011**
Mobile revenues company's subscriptions	**734.2**	**640.8**	**734.6**	**837.1**
Other mobile revenues	3.3	2.1	3.8	3.8
Total mobile revenues	**737.6**	**643.0**	**738.3**	**840.9**
Total revenues [1)]	**748.6**	**661.0**	**774.1**	**893.5**
[1)] Of which internal revenues	6.2	4.7	6.2	1.0
EBITDA before other income & expenses	132.0	161.0	229.8	329.0
Other income and expenses	-	(0.6)	(14.4)	(8.9)
EBITDA	132.0	160.4	215.5	320.1
Depreciation and amortisation	(189.3)	(200.9)	(215.2)	(238.8)
Impairment losses	-	-	-	-
Operating profit (loss)	**(57.2)**	**(40.5)**	**0.3**	**81.2**
EBITDA/Total revenues (%)	17.6%	24.3%	27.8%	35.8%
Operating profit/Total revenues (%)	(8%)	(6%)	0%	9%
Capital Expenditure (Capex)	567.0	203.5	102.6	95.0
Investments in businesses	16.9	-	-	-

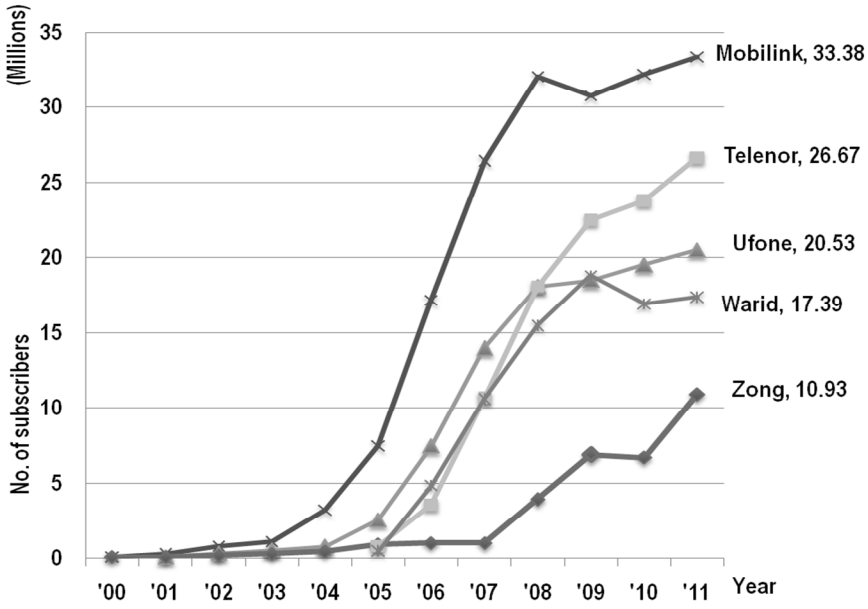
Source: Telenor Group website (last accessed 17, February 2012)

Exhibit 3: Financial performance relative to other regions, 2011



Source: Telenor Group website (last accessed 17, February 2012)

Exhibit 4: Mobile operator subscriber trends for Pakistan



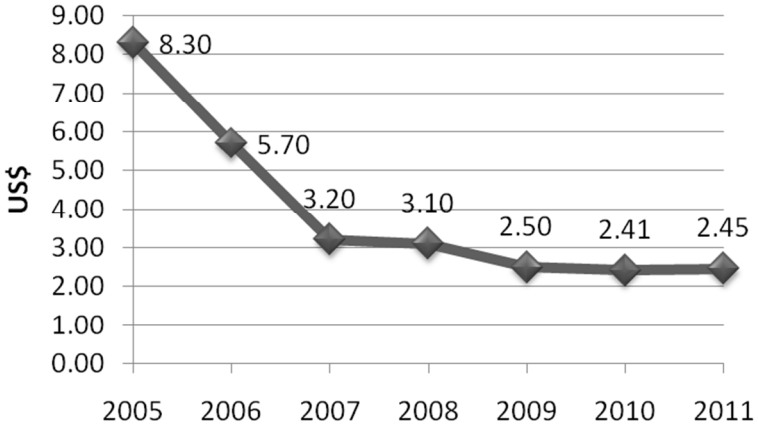
Source: Pakistan Telecommunication Authority website
- "Telecom Indicators" *(accessed on 18 February, 2012 – data points are for start of each year)*

Exhibit 5: Mobile subscription trends for Telenor Pakistan

	2008	2009	2010	2011
No. of mobile subscriptions (in thousands)	19,388	22,501	24,692	28,131
- of which prepaid	19,320	22,357	24,465	27,835
Average traffic minutes per subscription per month (AMPU)	157	162	182	202
Average revenue per subscription per month (ARPU)	$3.50	$2.53	$2.58	$2.63
- of which contract	$8.74	$10.78	$9.41	$8.59
- of which prepaid	$3.46	$2.49	$2.54	$2.58

Source: Telenor Group website (last accessed 17, February 2012)

Exhibit 6: Overall Average Revenue per User (ARPU) trend in Pakistan



Historical trend of overall Pakistani ARPU

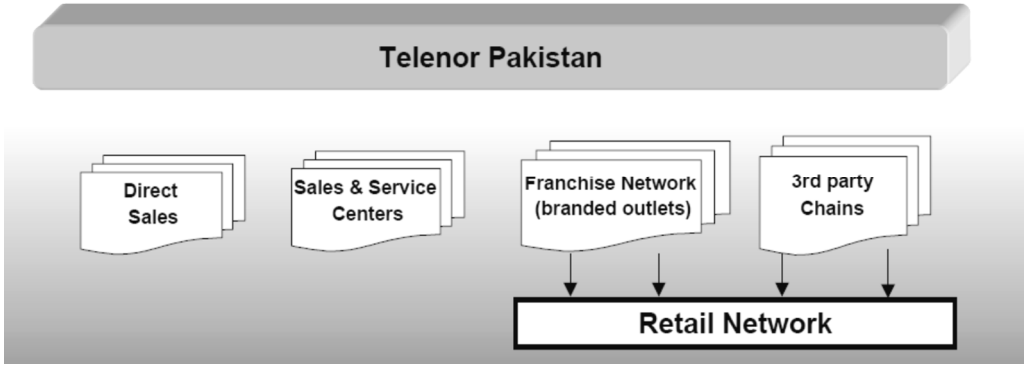
Source: Pakistan Telecommunications Authority, Annual Reports 2010-11

Exhibit 7: Recent monthly average revenue per user (ARPU) of Telenor Pakistan vis-a-vis other Telenor countries

(USD)	2007	2008	2009	2010	2011
Telenor Pakistan	**$ 4.31**	**$ 3.50**	**$ 2.58**	**$ 2.58**	**$ 2.63**
Grameenphone - Bangladesh	$ 4.73	$ 4.02	$ 3.46	$ 3.37	$ 2.89
DTAC - Thailand	$ 11.28	$ 9.90	$ 7.60	$ 8.49	$ 8.72
DiGi - Malaysia	$ 16.75	$ 18.40	$ 14.74	$ 16.39	$ 16.29
Uninor - India	N/A	N/A	N/A	$ 2.00	$ 2.14
Telenor (Norway)	$ 54.14	$ 61.09	$ 46.71	$ 50.97	$ 51.40
Sweden	$ 41.21	$ 44.28	$ 33.54	$ 37.32	$ 40.76

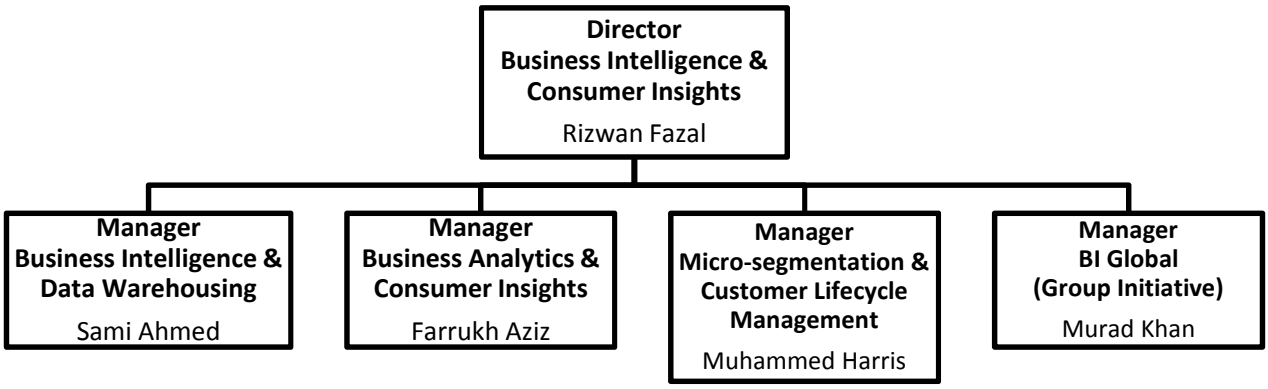
Source: Telenor Group website (last accessed 17, February 2012)

Exhibit 8: Telenor Pakistan distribution/collection model for SIM cards and prepayments



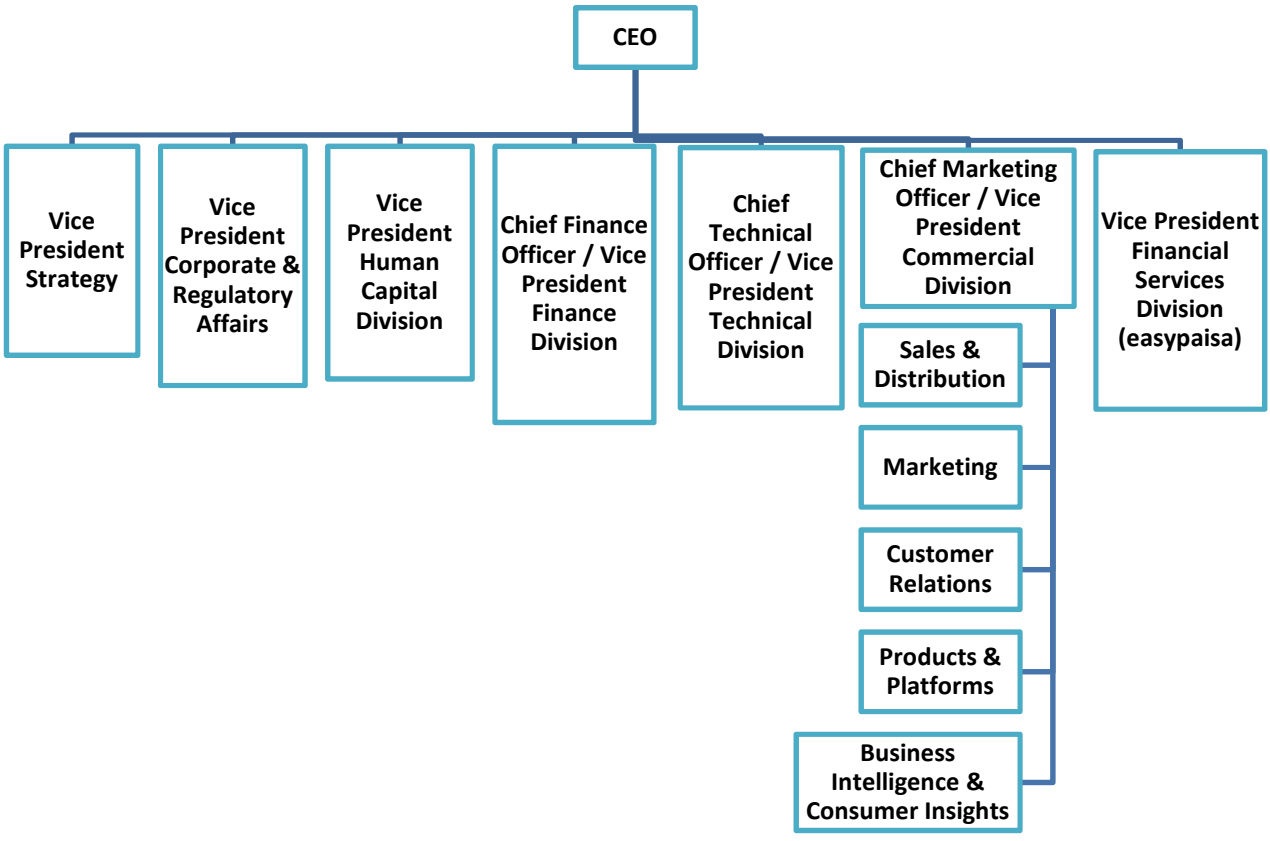
Source: Company Documents

Exhibit 9: Management structure of Business Intelligence, 2011



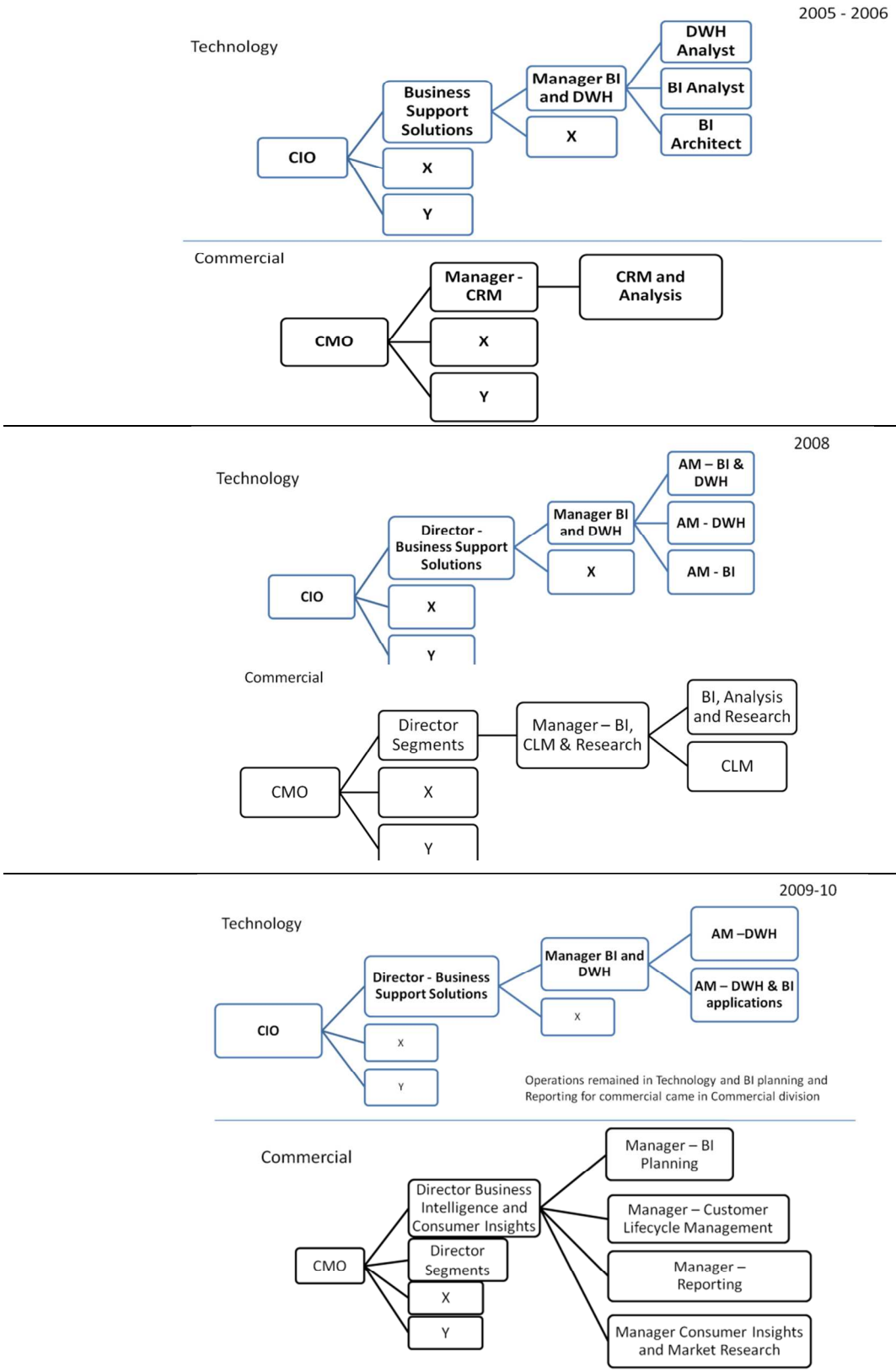
Source: Company Documents

Exhibit 10: Organizational structure of Telenor Pakistan, 2011



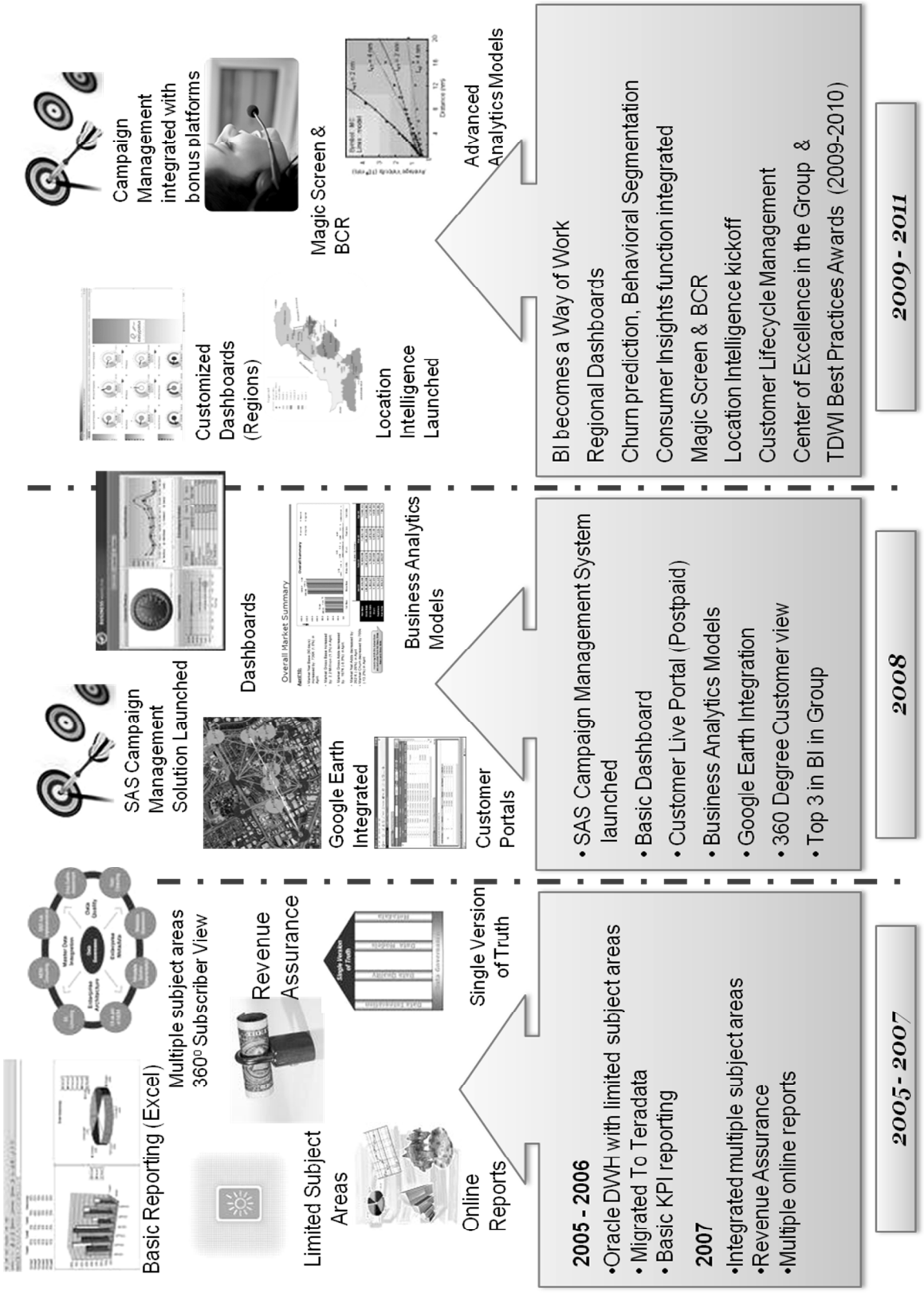
Source: Company Documents

Exhibit 11: BI organizational structure evolution 2005-2010



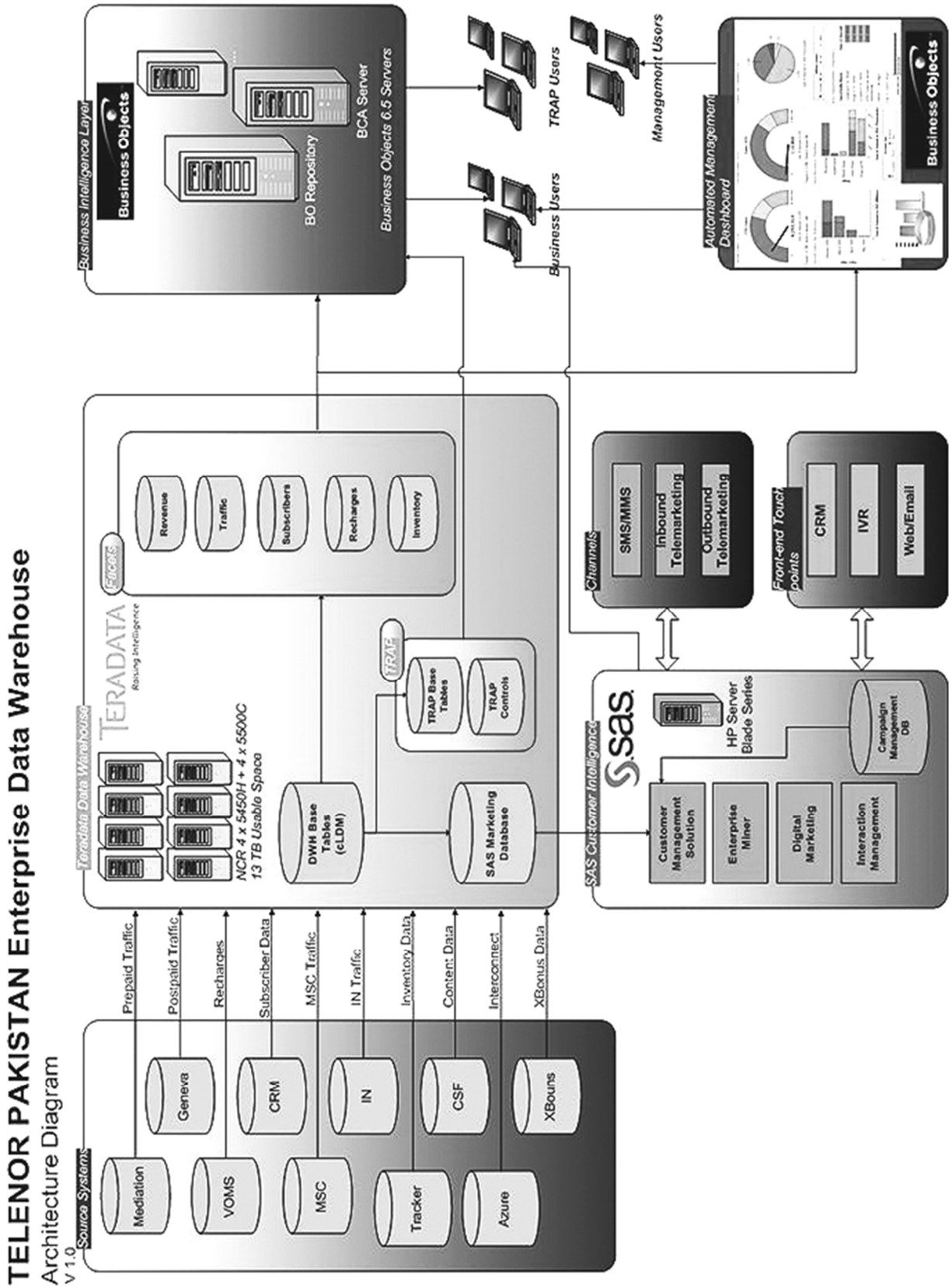
Source: Company Documents – Note: "AM" = "Assistant Manager" and "DWH" = "Data Warehouse"

Exhibit 12: Business Intelligence milestones at Telenor



Source: Company Documents

Exhibit 13: Architecture of BI at Telenor Pakistan (2011)



Source: Company Documents